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Global Trade Networks and Cross-Country Emissions Comovement: Evidence from International Data

Bongseok Choi[1,2], Seon Tae Kim[3], Namhun Kim[4]

[1]Kookmin University, Seoul, Korea, Republic of. [2]Corvinus University of Budapest, Budapest, Hungary. [3]Handong Global University, Pohang, Korea, Republic of. [4]NICE P&I, Seoul, Korea, Republic of

Extended Abstract

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Abstract Summary

This study examines how global trade structures influence cross-country comovement of carbon dioxide (CO_2) emissions. Using data from 98 countries spanning 1990 to 2019, we measure bilateral emissions comovement as the correlation of annual emissions growth rates across all country pairs and examine its relationship with both direct bilateral trade and indirect third-country trade linkages. To more accurately capture the environmental content of trade, we construct an emission-adjusted trade intensity measure that weights trade flows according to sector-specific carbon intensity. The results indicate that emissions comovement is stronger in direct bilateral trade relationships, whereas it weakens in indirect trade networks mediated by third countries—particularly when non-OECD economies serve as intermediaries. The projected correlation between trade linkages and emission comovement aligns with the predictions of the carbon leakage hypothesis, particularly when trade linkages are operationalized as indirect trade network exposure via non-OECD third-party countries.

Presenting Author Biography

Dr. Bongseok Choi is Associate Professor of Economics at the Department of Commerce and Finance of Kookmin University, South Korea. He received his Ph.D. from the State University of New York at Buffalo (USA). He was previously a Research Fellow at the Korea Energy Economics Institute. He explores the macroeconomics of environmental and energy transition, and the impact of international trade on business cycles. His current work focuses on environmental macroeconomics, especially optimal dynamic taxation, macroeconomic dynamics with transition risks. His work has been published in academic journals such as Energy Economics, Resource and Energy Economics, and Applied Economics.